

Svenska Elektriska Kommissionen, SEK

Fastställt	Utgåva	Sida	Ingår i
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Järnvägsanläggningar – Elektromagnetisk kompatibilitet (EMC) – Del 4: Signal- och telekommunikationsapparater

Railway applications –

Electromagnetic compatibility –

Part 4: Emission and immunity of the signalling and telecommunications apparatus

Som svensk standard gäller europastandarden EN 50121-4:2006. Den svenska standarden innehåller den officiella engelska språkversionen av EN 50121-4:2006.

Nationellt förord

Standarden skall användas tillsammans med SS-EN 50121-1.

Tidigare fastställd svensk standard SS-EN 50121-4, utgåva 1, 2000, gäller ej fr o m 2009-07-01.

ICS 29.020; 29.280; 45.020

Denna standard är fastställd av Svenska Elektriska Kommissionen, SEK, som också kan lämna upplysningar om **sakinnehållet** i standarden.
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Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

Svenska Elektriska Kommissionen, SEK, svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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English version

**Railway applications -
Electromagnetic compatibility
Part 4: Emission and immunity of the signalling and
telecommunications apparatus**

Applications ferroviaires -
Compatibilité électromagnétique
Partie 4: Emission et immunité
des appareils de signalisation
et de télécommunication

Bahnanwendungen -
Elektromagnetische Verträglichkeit
Teil 4: Störaussendungen und
Störfestigkeit von Signal- und
Telekommunikationseinrichtungen

This European Standard was approved by CENELEC on 2006-07-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by Technical Committee TC 9X: Electrical and electronic applications for railways. The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50121-4 on 2006-07-01.

This European Standard supersedes EN 50121-4:2000.

This European Standard is to be read in conjunction with EN 50121-1.

This standard forms Part 4 of the European Standard series EN 50121, published under the general title "Railway applications - Electromagnetic compatibility". The series consists of:

- Part 1 : General
- Part 2 : Emission of the whole railway system to the outside world
- Part 3-1 : Rolling stock - Train and complete vehicle
- Part 3-2 : Rolling stock - Apparatus
- Part 4 : Emission and immunity of the signalling and telecommunications apparatus
- Part 5 : Emission and immunity of fixed power supply installations and apparatus

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2007-07-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2009-07-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 89/336/EEC. See Annex ZZ.

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Introduction

This European Standard has been prepared in the form of a Product Standard.

It defines the immunity and emission test requirements for apparatus defined in the scope in relation to the electromagnetic disturbances likely to be experienced in the railway. In particular, the test requirements represent the essential electromagnetic immunity requirements and have been selected to ensure an adequate level of immunity for apparatus installed in the railway locations.

Test requirements are specified for each port considered.

Safety considerations are not covered by this standard.

In special situations, where the level of disturbances may exceed the levels considered in this standard, e.g. at a special location or where a hand held transmitter is used in very close proximity to an apparatus, special mitigation measures may have to be employed.

1 Scope

This European Standard applies to signalling and telecommunication apparatus which is installed in the railway environment. Signalling and telecommunication apparatus mounted in vehicles is covered by EN 50121-3-2.

This standard specifies limits for emission and immunity and provides performance criteria for signalling and telecommunications (S&T) apparatus which may interfere with other apparatus in the railway environment, or increase the total emissions for the railway environment beyond the limits defined in the appropriate standard and so risk causing Electro-Magnetic Interference (EMI) to apparatus outside the railway system.

Apparatus which complies with the emission levels of EN 61000-6-4 will meet the emission requirements of this standard provided that emissions from any d.c. power port are within the emissions limits specified for a.c. power ports. The immunity levels of EN 61000-6-2 will also be adequate except for the special case of apparatus as defined in note 1 of Table 1. This standard provides the immunity requirements for such apparatus.

The immunity levels given for the apparatus will in most cases allow the apparatus to perform as intended in the railway environment (see note). The immunity level establishes a common reference for evaluating the performance of the apparatus when subject to interference resulting from direct exposure of the apparatus and associated cables to a radio frequency field, or by coupling of the interference from a remote source.

If a port is intended to transmit or receive for the purpose of radio communication (intentional radiators, e.g. transponder systems), then the emission and immunity limits in this standard at the communication frequency do not apply.

The standard does not specify basic personal safety requirements for apparatus such as protection against electric shock, unsafe operation, insulation co-ordination and related dielectric tests. The requirements were developed for and are applicable to this set of apparatus when operating under normal conditions. Fault conditions of the apparatus have not been taken into account.

The requirements and test methods also apply to telecommunications and signalling data and power lines connected to the equipment under test (EUT).

The frequency range considered is from d.c. to 400 GHz. No measurements need to be performed at frequencies where no requirement is specified.

For products in the scope of EN 61000-3-2 or EN 61000-3-3, the requirements of those standards apply.

Testing methods are given in the basic standards listed in Clause 2, Normative references.

These specific provisions are to be used in conjunction with the general provisions in EN 50121-1.

NOTE The immunity and emission levels do not of themselves guarantee that the integration of apparatus will necessarily be satisfactory. The standard cannot cover all the possible configurations of the apparatus, but the test levels are sufficient to achieve satisfactory EMC in the majority of cases.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50121-1	Railway applications – Electromagnetic compatibility Part 1: General
EN 50121-3-2	Railway applications – Electromagnetic compatibility Part 3-2: Rolling stock – Apparatus
EN 61000-3-2	Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current up to and including 16 A per phase) (IEC 61000-3-2)
EN 61000-3-3	Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection (IEC 61000-3-3)
EN 61000-4-1	Electromagnetic compatibility (EMC) – Part 4-1: Testing and measurement techniques – Overview of IEC 61000-4 series (IEC 61000-4-1)
EN 61000-4-2	Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test (IEC 61000-4-2)
EN 61000-4-3	Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test (IEC 61000-4-3)
EN 61000-4-4	Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test (IEC 61000-4-4)
EN 61000-4-5	Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test (IEC 61000-4-5)
EN 61000-4-6	Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields (IEC 61000-4-6)
EN 61000-4-8	Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test (IEC 61000-4-8)
EN 61000-4-9	Electromagnetic compatibility (EMC) – Part 4-9: Testing and measurement techniques – Pulse magnetic field immunity test (IEC 61000-4-9)
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments (IEC 61000-6-2)